Science Drivers for the SPICA Mission: Extrasolar Planets and their Formation

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It is needless to say that the detection and characterization of extrasolar planets is one of the most important topics of any future optical-IR observatories. The SPICA is the space mission to launch a 3.5-m diameter, cooled, single-mirror telescope working at mid- and far-infrared wavelengths. Although the spatial resolutions are not high enough to resolve the planets discovered by the radial velocity measurements, the high sensitivity of the SPICA is a powerful tool to conduct imaging and spectroscopy of possible planets and companion brown dwarfs relatively away from the central star. This potential will be enhanced if a coronagraphic instrument is equipped for SPICA, which takes advantages of its non-segmented large primary mirror. Direct observations of the formation site of such planets, protoplanetary disks, also merit from such a capability. In this contribution, we will describe the SPICA coronagraph instrument and its various scientific applications for studies on extrasolar planet, brown dwarf studies, and planet formation.

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